

ARCHITECTURE. HISTORY AND PROJECT

Centro Interdipartimentale FULL/DAD/CRT - The City Below. Underground Space and Urban Morphology

Funded By	Centro Interdipartimentale FULL FONDAZIONE CRT CASSA DI RISPARMIO DI TORINO [Piva/CF:06655250014] Dipartimento DAD
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Context of the research activity	<p>The PhD research proposal is intimately connected with a prolific research field on urban morphology, that characterizes the activity of both the PhD Program "Architecture. History and Project" (DASP) and the Future Urban Legacy Lab (FULL). In particular the proposed activity can take advantage of (and it could contribute to) at least two different branches of research, that are currently active in DASP and FULL.</p> <p>Firstly the recent PhD joint research program "Transitional Morphologies", directed by Proff. Marco Trisciuoglio (PoliTO) and Bao LI (SEU Nanjing), aimed at studying the influences of urban morphology in the evolution of the city fabrics. In this case the proposed work could add an innovative point of view through the exploration of the multiple connections between the shape of the underground network of spaces and the "out in the open" city, trying to establish an operational link, from a spatial point of view, between these two separate domains.</p> <p>Secondly the research could be effectively linked with the ongoing work about the construction of a "Digital Tween" of Torino, which is currently under development with the contribution of FULL.</p> <p>The DASP at Politecnico di Torino has been recognized by the Italian national evaluation council ANVUR, for the 37th cycle (2021-2024), as INNOVATIVE in its international, interdisciplinary and (for the first time) inter-collaborative approaches.</p> <p>The new recognition for inter-collaborative approach is due to the link with some development enterprises and research centers. Among them, FULL, hosts and tutors some DASP PhD Candidates each year since 2018.</p>
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Context of the research activity	<p>Cities' ground is usually perceived mostly as a bidimensional entity, a generic flat or curved surface where the buildings are simply laid down, and where the patchwork of streets, squares, green areas, etc. overlaps the tessellation of the property boundaries.</p> <p>Despite being the place where a large part of the collective services are located, and in some cases where the relics themselves of the past</p>
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Objectives

urbanization are still present, the underground parts of the city, by their nature of "negative" spaces carved into the ground, escape an overall understanding and their knowledge is often fragmentary and limited to some occasional places; even when they are open to the public, like it happens in the subway networks, in the underground parkings, in some archeological sites, in the clusters of the commercial basements that are often present in the biggest cities, etc.

Yet, the layering of the urban ground, while being for the most part "hidden" to the common perception - is actually an integral part of urban design, not just in technical terms (geological characteristics, infrastructural networks, drainage systems and so on), but besides this also in morphological terms. The construction and the transformation of the city is always closely connected with the background of the subterranean structure of the ground: the buildings are never just "laid down" on the ground, as they dig new underground volumes, that provide space for essential functions; the streets are never just bidimensional ribbons of asphalt, as they normally host under their surfaces a thick bundle of underground services, like sewage and freshwater piping, district heating and data networks etc.; the subway systems are not just limited to the isolated spaces of the stations, as they carve long tunnels through the city, whose layouts must deal with all the other subterranean presences, (especially - in historical cities - those ones that represent the legacy of the ancient forms of the city).

This topic becomes more and more important as the size of the city tends to grow, and especially as the complexity of its morphological layout and the density of its infrastructural network increase.

The international debate about this argument is rapidly growing in the last years and we can count a number of cities that started to take into account this dimension of urban design and to integrate it into the planning strategies. In Italy a first effort of dealing with this topic has been the introduction of the P.U.G.G.S. (Piano Urbano Generale dei Servizi in Sottosuolo), which is a first - and still quite functionalistic - attempt of introducing this variable in the design of the city; but much work could be still to be done, especially from the spatial point of view.

The aim of the work is exploring the potentialities and the limits of the introduction of the "Undeground landscape" within the debate about the growth and the transformation of the city.

The proposed research will explore the topic both from a theoretical point of view, through a deep analysis of the state-of-the-art of the international debate, and with a practical application on a real (or some real) case study(ies).

Skills and competencies for the development of the activity

Expertise in mapping and general knowledge of the topic, particularly referred to the following bibliographic references:

- Reynolds, E., 2019, *Underground Urbanism*, Routledge
- Ruming, K., McGuirk, P., Mee, K., 2021, What lies beneath? The material agency and politics of the underground in urban regeneration, in *Geoforum*, n. 126, November, Pp. 159-170
- Frampton, A., Solomon, J. D., Wong C., 2012, *Cities Without Ground. A Hong Kong Guidebook*, ORO
- Bélanger, P., 2007, Underground landscape: The urbanism and infrastructure of Toronto's downtown pedestrian network, in *Tunnelling and Underground Space Technology*, Volume 22, Issue 3, May, Pp. 272-292
- Bélanger, P., 2016, *Landscape as Infrastructure*, Routledge